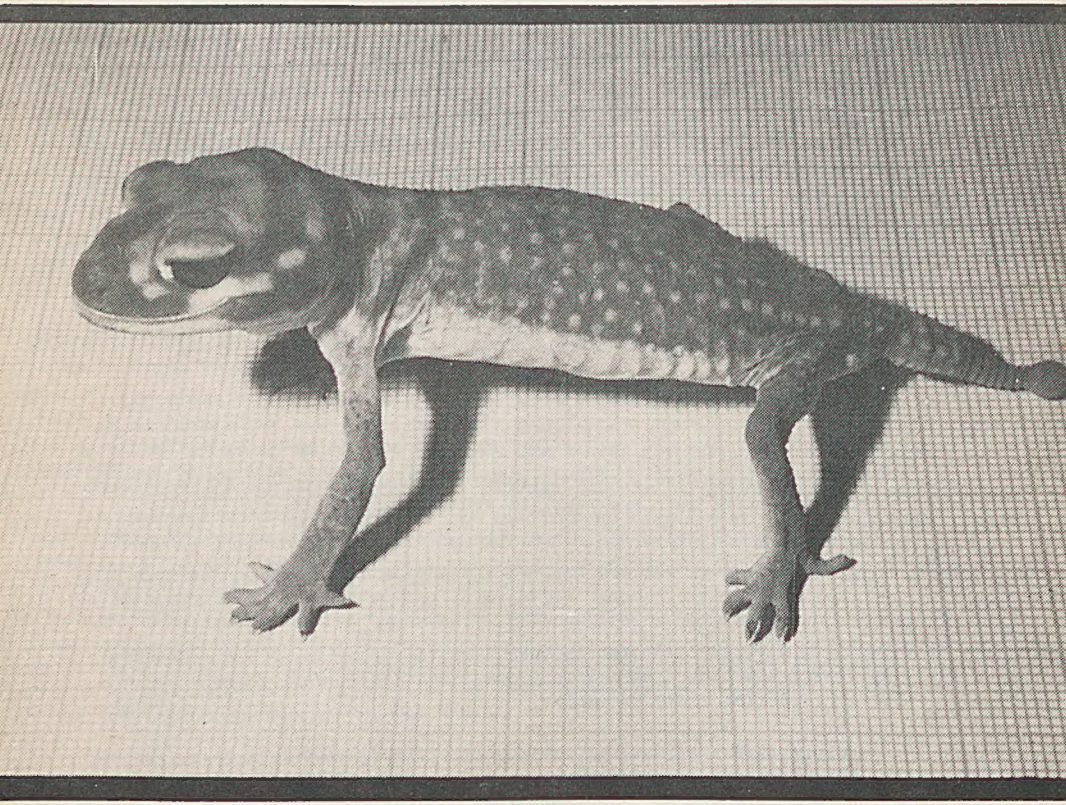
REC. PRICE $1.00

VOL. 8 No. 2 AUGUST 1976

HERPETOFAUNA



NEPHRURUS STELLATUS

"Herpetofauna" incorporates the "South Australian Herpetologist" and the "Bulletin of Herpetology" and is published by the Australasian Affiliation of Herpetological Societies. Its member societies are:

AUSTRALIAN HERPETOLOGICAL SOCIETY

President	: Marion Anstis
Secretary	: Peter Rankin
Correspondence to	: P.O. Box R79, Royal Exchange, Sydney 2001.

SOUTH AUSTRALIAN HERPETOLOGY GROUP (INC)

President	: Julian White
Secretary	: John Fowler
Correspondence to	: 4 Elderslie Ave., Fitzroy, S.A. 5082

VICTORIAN HERPETOLOGICAL SOCIETY

President	: Ray Draper
Secretary	: Rhonda Draper
Corresondence to	: 51 Glen Morgan St., East Brunswick, 3057

WESTERN HERPETOLOGY GROUP

President	: Peter Mirtschin
Secretary	: Peter Hudson
Correspondence to	: 18 Creber St., Whyalla Playford, 5600.

****

The Affiliation's objects are:

1. To promote the scientific study of amphibians and reptiles.
2. To promote an active interest in conservation and in particular of amphibians and reptiles and their habitats.
3. To publish and distribute the journal known as "Herpetofauna".
4. To promote liaison between the member Societies and between individuals through field work, conventions, the distribution of "Herpetofauna" and the distribution of other information.
5. To facilitate representation at the national and international level of its member societies' interests, particularly where a unified stand is needed.

****

The Australian Affiliation of Herpetological Societies (AAHS) is almost official. Almost, because the final formalities of signing by each society's President and Secretary is currently underway. Significant and important changes and compromises had to be made to the Constitution, but the final result should provide good stable guidance for the Affiliation.

Societies with an active interest in herpetology are warmly invited to join the Affiliation. Please contact the Convenor for further details.

There is widespread concern about the effects that protective legislation (and more so the way it is implemented) is having on herpetology is Australia. It seems a lot of emphasis is being placed on the effect of herpetological activities while habitat destruction by various human activities is not being put into proper perspective and is even being ignored.

The legislation in each state is clearly intended to deal with the long lerm conservation of reptiles rather than simply the control of herpetological activities. Commercial exploitation of reptiles certainly had to be controlled, it was often a ruthless trade in which a few unthinking herpetologists were involved. Most herpetologists today have an appreciation of conservation principles.

There is no biological evidence to indicate that normal herpetological activities have led to declines in reptile populations. A handful of species with very narrow habitat requirements or restricted distributions may be adversely affected by excess collecting. But a better known example of this, the Broad-headed Snake (Hoplocephalus bungaroides) of the sandstone ridges near Sydney, has been more seriously affected by removal of bush rock from its ridge top habitat for garden landscaping than by collectors.

Neither is there evidence that the restrictions which have been imposed have led to an increase in reptile populations.

Where legislation or its application is not based on sound biological principles there is an inevitable loss of respect for the law and the authority charged with its application. It seems ironic that the very people interested in the long-term conservation of reptiles and who pressed for better protection, are often adversely affected by the way the legislation is being applied. Perhaps what's needed is a frank exchange of the difficulties and concerns on both sides. Both the fauna authorities and herpetologists stand to gain from improved co-operation and relationships. Both can work together more closely in their common aim of ensuring the survival of reptiles.

A re-assessment of the effects present policies and priorities will have on the long-term conservation and survival of reptiles is needed. The role that herpetologists have played in providing information of great value in conservation matters cannot be over-emphasised. Their past contributions should not be used to unnecessarily limit their activities in the future.

ADDITIONAL NOTES ON THE CONONDALE RANGE HERPETOFAUNA.

By G.V. Czechura, Wootha Rd., Maleny, Qld., 4552

Czechura (1975) reported on the frog fauna of Conondale Range 90 km north of Brisbane. The following contribution reports on the reptile fauna of this same area. The former arbitary 500m distinctions between 'range' and 'lowland' elements within the fauna, (Czechura, op. cit), are also used here.

TABLE 1
LOWLAND REPTILE FAUNA OF CONONDALE RANGE

CHELIDAE	SCINCIDAE
Chelodina expansa	Carlia burnetti
GEKKONIDAE	Carlia pectoralis *
Oedura robusta	Carlia vivax
Gehyra variegata	Cryptoblepharus boutoni
PYGOPODIDAE	ELAPIDAE
Lialis burtoni	Cacophis harritae
AGAMIDAE	Furina diadema *
Amphibolurus barbatus	
Amphibolurus maricatus	
Diphoriphora sp *	

With the sole exception of C. boutoni the distribution of 'lowland' reptile fauna follows that of the drier open forests. Their absence for the 'range' fauna reflects the relative scarcity of such habitat above 500m a.s.l. Observations in the Conondale and neighbouring Blackall Ranges suggest that altitude may influence the distribution of C. boutoni.

Within the lowland fauna is a group of reptiles (indicated by an asterisk*) which are only known from the dry forests in the extreme north-east of Conondale Range.

Table 2 gives a list of 'range' reptiles.

A large number, (twenty-three out of thirty-five species) occur in rain-forest or tall open forest habitat. Of these several are confined to this form of habitat. Foremost among these are Gonocephalus spinipes, Egernia major, Lampropholis challengeri, L. delicata, Sphenomorphus murrayi, the two undescribed Sphenomorphus spp., Cacophis spp, Hoplocephalus stephensi, and Tropidechis carinatus.

The two undescribed Sphenomorphus represent different species groups. One is a member of the S. scutirostrum species group, This lizard occurs sympatrically with S. scutirostrum in climax rainforest. S. sp. differs in colouration and has a more robust build and a different degree of ear loss in comparison with S. scutirostrum. Greer (1973) has commented on different degrees of ear loss in burrowing New Guinea Sphenomorphus.

TABLE 2
'RANGE' REPTILES FROM CONONDALE RANGE

GEKKONIDAE	VARANIDAE
Oedura tryoni	Varanus varius
AGAMIDAE	BOIDAE
Physignathus lesueuri	Morelia spilotes variegata
Gonocephalus spinipes	COLUBRIDAE
SCINCIDEA	Dendrelaphis punctulatus
Egernia frerei	Amphiesma mairii
Egernia major	Boiga irregularis
Tiliqua gerrardi	ELAPIDAE
Tiliqua scincoides	Acanthophis antarticus
Anomalopus verreauxi	Cacophis squamulosus
Ctenotus robusta	Cacophis krefftii
Ctenotus taeniolatus	Cryptophis nigrescens
Lampropholis challengeri	Demansia psammophis
Lampropholis delicata	Hemiaspis signata
Lampropholis guichenoti	Hoplocephalus stephensi
Sphenomorphus quoyi	Pseudonaja textilis
Sphenomorphus murrayi	Tropidechis carinatus
Sphenomorphus tenuis	Vermicella annulata
Sphenomorphus sp.	
Sphenomorphus scutirostrum	
Sphenomorphus sp.	

The other undescribed Sphenomorphus belongs to the S. tenuis complex. It is easily separated from S. tenuis by its different colouration and preference for more humid habitats.

It should be noted that Gonocephalus spinipes, Sphenomorphus murrayi and Egernia major all approach the northernlimits or their distributions in the Conondale Range area.

A further addition to the Conondale Range 'range' fauna may be a large Anomalopus, probably A. reticulatus. The skin casts of a large Anomalopus have been found under debris in rainforest. Czechura (1974) reports on the occurrance of A. reticulatus on the neighbouring Blackall Range at Maleny, therefore, these sloughs may be those of A. reticulatus.

ADDITIONS TO THE FROG FAUNA

Recently Ingram, Anstis and Corben (1975) recorded the Marsupial Frog (Assa darlingtoni) from Conondale Range. This frog is a member of the 'range' fauna. Assa is found in 'pockets' in rainforest. These pockets, although containing quite large local populations of the frog, are often well separated from their nearest

neighbours. The environmental parameters causing this patchy distribiton are unknown to us, but have their parallel with the distributions of several rainforest carabid beetles (G. Maywald, pers. comm.).

The hylid frog, Litoria nasuta has recently been added to the known 'lowland' frog fauna.

COMMENTS

The Conondale Range herpetofauna contains many rainforest frequenting forms which may be seriously disadvantaged by habitat disturbance. The effect on tall open forest ('wet'sclerophyll) forms also may be serious, as evidenced by recent surveys of clear-fell sites at Monsildale (west of Conondale Range), and on Little Yabba Creek, (northern slopes of Conondale Range). In both areas, large tracts of humic forest have been cleared for pine planting, (particularly for Araucaria cunninghami). At both sites unspecialized and open forest/grassland tolerant species persist eg. Common Froglet (Ranidella signifera) and Grass Skink (Lampropholis guichenoti).

Highly specialized forms eg. Rheobatrachus, Taudactylus diurnis and Sphenomorphus murrayi were not recorded. Observations of such lizards as Lampropholis challengeri were restricted to the margins of remaining forest, at cleared sites.

A more comprehensive report on such faunal differences is being prepared.

ACKNOWLEDGEMENTS

I wish to thank all members of Wildlife Research Group (Qld.) and Save Conondale Range Committee who have assisted in field surveys.

REFERENCES

Czechura, G.V. (1974)-'A new south-east locality for the skink Anomalopus reticulatus.' Herpetofauna 7 (1) pp 24-25

Czechura, G.V. (1975)-'Notes on the frog fauna of Conondale Range, south-east Queensland.' Herpetofauna 7 (2) pp 2-4

Greer, A.E. (1973) -'Two new lygosomine skinks from New Guinea with comments on the loss of the external ear in lygosomines.....' Breviora No. 406 pp 1-25

Ingram, G.J.; Anstis, M.; Corben, C.J. (1975)-'Observations of the Australian leptodactylid frog, Assa darlingtoni' Herpetologica 31 (4) pp 425-429

****

SNAKES OF THE BUNDABERG REGION – ADDENDA

The following additional information to 'Snakes of the Bundaberg Region' which appeared in Herpetofauna 7 (2), has been supplied by the author.

Coral Snake Simoselaps australis Rare.

Taipan Oxyuranus scutellatus have been caught at Baffle Creek, approximately 65km north of Bundaberg, by the Queensland Museum.

THE REPTILES OF THE MOUNT LOFTY RANGERS SOUTH AUSTRALIA, PART 2

By H.F.W. Ehmann, 55 Braund Rd., Prospect, 5082.

SUMMARY

35 species of reptiles were reported in Part 1 (Herpetofauna 8 (1), Feb. 1976). Part 2 reports on a further species of skink (Ctenotus uber).

The composition of the reptile fauna is analysed in terms of present and inferred past distributions. There is a predominance of southeastern Australian species (Bassian Subregion) and semi-arid and arid species (Eyrean Subregion). There are also relictual, endemic and southwestern Australian elements.

The Murray Valley is an exchange corridor for 4 species with their like populations in southeastern Australia.

OBSERVATIONS: (continued)

Ctenotus uber - this species of skink was recently collected near Cherry Gardens (2 km NE of Clarendon) by Mr. Fowler (SAHG). The specimens he donated to the South Australian Museum are Ctenotus uber orientalis Storr (1971). In other areas (Olary, northern Flinders Ranges) this species is associated with large thin rock slabs well embedded on sandy well-drained skeletal or sandy soils. The slabs may be cleaved fragments or exfoliations. Extensive multichambered burrow systems are excavated such that the lower slab forms the roof of these near-surface tunnels. One or two burrows are dug down into the soil and I have found up to four specimens inhabiting the one system. Occasionally this species excavates such systems under well embedded sheet iron.

DISCUSSION:

The occurrence of the Mt. Lofty Ranges reptiles in other (mainly adjacent) areas.

The categories used in the following dicussion are a convenient means of analysing the relationships of the Mt. Lofty Ranges reptiles in terms of surrounding areas and Australian zoogeographic Subregions.

Each category has a distinct assemblage of reptiles in common with the Ranges. The peripheral area boundaries shown in Fig. 2 do not indicate the full extent of the areas as discussed.

Table 2 summarises the nearby distribution of the 36 species found in the Ranges, and Fig. 2 maps the areas discussed.

Widespread in adjacent areas of South Australia generally:

The 5 species indicated occur throughout most of South Australia in various habitats.

Adjacent semi-arid areas to the north and northeast:

This includes the drier Murray Mallee open scrub to the east, the low woodlands and shrublands to the northeast and the open scrub on the coastal (western side) plain extending south to Port Pirie.

Both the geckoes H. binoei and G. variegata are intrusive elements from the semi-arid area to the northeast, and just encroach on the drier eastern slopes and the northernmost parts of the Ranges.

Northern-most Upper South East of SA (wet mallee and heathlands only):

The soils of this area are sandy (and often also calcareous) and well drained. There is an absence of permanent fresh surface water over most of the area, despite a relatively high rainfall (at least 400 mm yearly). The stunted heath vegetation widely distributed there has developed as a result of soil nutrient deficiencies. This area is at present almost certainly a barrier to the dispersal of fresh-water dependent species such as the Tiger Snake (Notechis scutatus) and the long-necked Tortoise (Chelodina longicollis) between the South East and the Murray system. The Coorong (see Fig. 2) in this area is now practically permanent sea water. (Evaporative concentration sometimes drives the salinity even higher). It is continuous with the sea (not Lake Alexandrina) since the construction of the Murray Barrages. The diversion of the South East surface drainage waters via artificial drains directly into the sea near Kingston rather than the natural flow along the Reedy Creek - Salt Creek - Coorong system (Sprigg, 1952) means the upper Coorong no longer receives the amount of South Eastern water that it used to (even if it was only intermittent). There is little doubt that prior to these hydrological modifications there were wide fluctuations in the Coorong's fresh-water-seawater balance. The freshwater dependent reptile species could have moved northward to the Murray system at times of sustained heavy freshwater flows from the South East along the Coorong.It is equally likely that at times of low water levels in the Coorong and flooding of the Murray that water dependent reptiles from the Murray system entered at least the northern part of the Coorong. Migrations of freshwater and swamp dependent species between the South East and the Murray system probably only had an indirect effect on the populations in the Mt. Lofty Ranges.

The South East of South Australia (other than the northern-most Upper South East and southwestern Victoria:

This area is relatively flat with well developed sub-parallel ridges (former coastal dunes) which are more or less aligned with the coast. These ridges are sandy while between them the flat areas have marshes, swamps and lagoons. These ridges run into the disordered sandy areas of the northern-most Upper South East. The lagoons change to swamps, to marshes and finally disappear altogether in the northernmost Upper South East. Near and across the South Australian-Victorian border the ground is higher but still relatively flat and flood prone, and in the vicinity of Mt. Gambier similar conditions exist. Many of the swamps have been drained.

The South East supports a complex of open forest, open scrub, tussock grassland and heath vegetations the distributions of which are at least partly dependent on the sub-parallel ridge systems.

The goanna Varanus gouldii rosenbergi in this area appears to be confined to a few wet heath localities, eg Big Heath Conservation Park (the late M. Smyth, pers com.) where the soils are sandy and well drained.

The skink Sphenomorphus tympanum is recorded from both living and fossil material from Naracoote (Smith, 1976).

Southern Flinders Ranges:

This area is geologically continuous with the Mt. Lofty Ranges but much of the area has been cleared for farming. Only a few pockets of scrub and roadside verges, scattered rock outcrops and watercourse habitats maintain moderately diverse reptile faunas.

The rock crevice inhabiting Tawny Dragon (Amphibolurus decresii) extends through

this area and occurs in the northern Flinders Ranges, on the Olary Ridge, and is to date known from as far northeast as Koonanberry Mountain north of Broken Hill in New South Wales (Australian Museum specimen R50540), an 84 km northward extension of the previously known range to Mootwingie (Houston 1974). Its ability to inhabit areas with such a wide range of climatic conditions suggest that it chooses and finds microhabitats which minimise the effects of the climatic extremes in its range of distribution. Thus on the semi-arid Olary Ridge it inhabits the rocky beds of intermittent water courses while in the Mt. Lofty area it inhabits well exposed slope and ridge rock outcrops with sunbasking sites that can be utilised throughout the day.

The legless lizard Delma molleri is presently known only from the Southern Flinders Ranges, the Mt. Lofty Ranges and Yorke Peninsula.

The other species tabulated are either of essentially southeastern Australian distributions (from the warm temperate zone of the Bassian Subregion in the sense of Rawlinson, 1971) or of southern Australian distribution (semi-arid Eyrean Subregion).

The Eastern Bluetongue (Tiliqua scincoides) occurs in isolated, relictual pockets to the west of Spencer Gulf in the Gawler Ranges. Mr. D. Kraehenbeuhl of the SA Field Naturalists' Society collected a specimen near Hiltaba in 1972.

Yorke Peninsula and Adelaide Plain:

This area has been extensively cleared for agriculture. The remaining vegetation is predominantly open woodland and scrub mallee on calcareous soils with a fringing coastal dune system. There are very few rock outcrops other than sheet limestone. The western side of the Peninsula receives about the same average rainfall as the northern Mt. Lofty Ranges. Ehmann (1973) discusses the reptiles of Yorke Peninsula in detail.

Murray system in South Australia:

This area as discussed here includes Lake Alexandrina and Lake Albert (known also as the Murray Lakes) into which the Murray flows. The Murray Valley is cut into the plain upstream from the Lakes. Since the construction of the Murray barrages this system has experienced more stable ecological conditions. Formerly during low River conditions sea water entered the Murray Lakes and the lower section of the Murray Valley at high tide and almost certainly affected reptile species dependent on fresh water and intolerant of saline waters.

The characteristic river swamp vegetation in the Murray Valley contrasts stongly with the open mallee scrub and (less common) woodlands on either side.

The Eastern Water Skink (Sphenomorphus quoyii) and the Red-bellied Black Snake (Pseudechis porphyriacus) in South Australia are found only in the Murray Valley and in the Mt. Lofty Ranges. The Eastern Water Skink is not widespread in the Ranges and is common only in the Sturt Creek and also occurs in the Onkaparinga River. It is common on the Murray near the water's edge, particularly in the vicinity of the incised eroded limestone cliffs. I have not been able to find this species in the watercourses flowing into the Murray system. Its absence from many apparently suitable watercourses suggests that the species has only recently invaded the Ranges.

The Red-bellied Black Snake inhabits most of the watercourses and swamps in the Ranges including the Marne River, Sanders Creek and Reedy Creek. These three watercourses flow intermittently and drain directly into the Murray River.

Both these species are common and widely distributed in southeastern Australia. The Mt. Lofty Ranges populations appear more or less continuous with the eastern Australian ones via the Murray Valley.

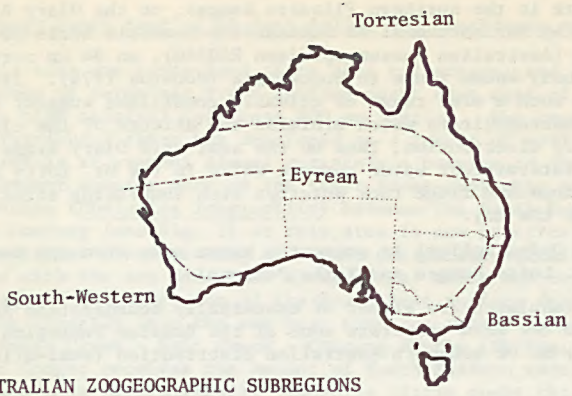


FIG .1. AUSTRALIAN ZOOGEOGRAPHIC SUBREGIONS

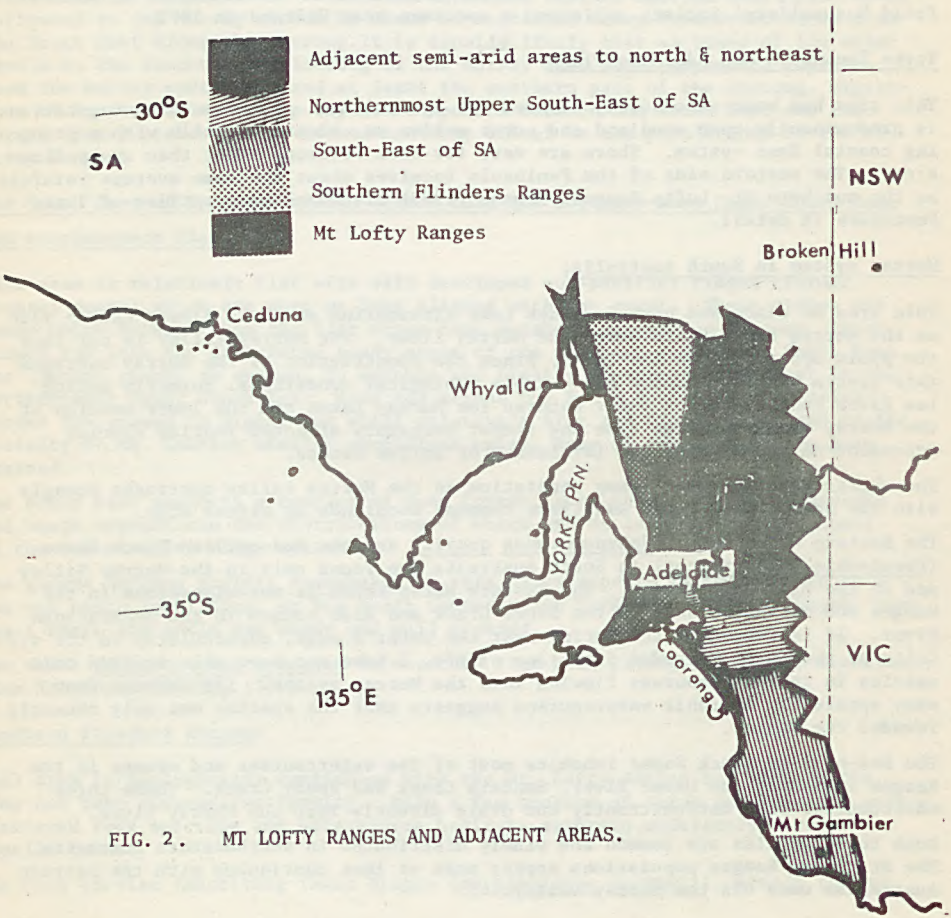


FIG. 2. MT LOFTY RANGES AND ADJACENT AREAS.

The Mt. Lofty Ranges populations of both the Tiger Snake (Notechis scutatus) and the Long-necked Tortoise (Chelodina longicollis) are probably derived from and have a high degree of exchange with (or even input from) the Murray Valley Populations. The Murray Valley populations in turn probably experienced some exchange with the South Eastern SA populations (see earlier discussion on Coorong - Murray exchange).

The Tree Skink (Egernia striolata) in the Murray Valley is limited to places where encroachment of extensive tracts of Myoporum, Callitris or Casuarina open woodlands occur. It inhabits dead River Red Gums (E. camaldulensis) at least as far downstream as Morgan.

Upstream from Morgan the Eastern Brown Snake (Pseudonaja textilis) appears to be restricted to the Murray Valley and adjacent low-lying areas subject to inundation. Further from the River in the drier sandy soils the Western Brown Snake (Pseudonaja nuchalis) is common. Downstream from Morgan the Eastern Brown Snake is not limited to the Murray Valley.

Isolated on SA off-shore islands:

This category is added as evidence for restriction in distributions and also isolation of some species during the past 18,000 years. These distribution restrictions and isolations are correlated with late-Pleistocene (up to 1,500,000 years before present) and Holocene (up to 10,000 years before present) glacial and interglacial periods which altered sea levels and climatic conditions (see Jessup, 1961). The islands are not specified, some have probably been isolated about 10,000 (eg Kangaroo Island) while others have been isolated for shorter times.

Relictual in the Mt. Lofty Ranges:

This category is used for species and (as presently recognised) subspecies which are clearly isolated from other populations by at least 150 km or by intervening sea. They appear to be restricted to one or a few small local and isolated populations. They all appear to have very specific habitat requirements.

The goanna Varanus gouldii rosenbergi was described by Mertens (1957) from the Stirling Ranges in southwestern Western Australia. Besides the populations near Mylor and Kuitpo it occurs also in the wet heathlands of the South-East (see earlier) and on Kangaroo Island. The mainland populations in South Australia inhabit hill slopes and ridges having sandy well drained soils with heath and sometimes low open scrub vegetation. Relatively high rainfalls (at least 600 mm yearly) occur in the areas inhabited by this sub-species.

The nearest populations of Cunningham's Skink (Egernia cunninghami) outside the Mt. Lofty Ranges are in western Victoria. The Ranges population are without doubt outliers of the far more widespread southeastern Australian populations. How a skink so dependent on a relatively high rainfall (more than 400 mm yearly) and rock crevices came to inhabit the Ranges is difficult to explain. The scattered granite outcrops in the South East referred to by Sprigg (1958) as the surface expression of the Padthaway buried horst seem too few and far spaced to allow migration from the southwestern Victoria. It is possible that the skink was once more or less continuously distributed on the Mt. Lofty and southern Flinders Ranges, the Olary Ridge, the Barrier Range and the Grey Range and thence the Great Dividing Range in southeastern Queensland. These ranges encircle the Murray - Darling catchment area.

Rawlinson (1974) has discussed evidence for a warm wet postglacial pluvial period between about 12,000 and 6,000 years ago in southern Victoria. The climate in the interior and presently arid and semi-arid ranges has almost certainly been much wetter in the past. Subsequent and present aridity in the intervening ranges and outcrops would account for the isolation of the Mt. Lofty Ranges population from

the south eastern Australian ones.

The skink Sphenomorphus tympanum (warm termperate form of Rawlinson, 1971) occurs only in humid temperate habitats. It occurs also in the South East, and in wetter times (12,000 to 6,000 years ago) it probably had a more or less continuous distribution from the South East to the Mt. Lofty Ranges, probably inhabiting parts of the Murray Valley as well.

The drier climatic conditions of the past 6,000 years have isolated the Mt. Lofty Ranges populations.

Austrelaps sp. This species is closely allied to the highland form of Denisonia superba of Rawlinson (1971) (Austrelaps superbus). He records it from the high altitude cold and cool termperate zones of the Bassian in Victoria and New South Wales. The South Australian populations have adapted to and survive in the warm temperate conditions of the higher wet pockets in the Mt. Lofty Ranges and also on Kangaroo Island. Whether it is specifically distinct from the southeastern Australian highland forms remains to be demonstrated. The presence of this species in the Ranges and on Kangaroo Island is best explained in similar fashion to that of Sphenomorphus tympanum. The closest population occurs in the Grampians in western Victoria.

The snake, Suta flagellum like Cunningham's Skink is associated with rock outcrops and inhabits areas of average yearly rainfall as low as 380 mm provided exfoliated or slab rock is present. It does not occur on sandy soils, and the closest populations occur in western Victoria.

Discussion:

The Mt. Lofty Ranges and Australian Zoogeography:

Figure 1 shows the Australian Zoogeographic Subregions (after Keast, 1959).

Table 2 summarised the broad Australian zoogeographic distribution of the species found in the Ranges. Nineteen of the 36 species (53%) are of a generally eastern and southeastern Australian distribution corresponding with the Bassian Subregion as defined by Rawlinson (1966), but only 9 of these maintain broad distributional contact with their like populations in the east and southeast of the continent. Thus there is a distinct affinity with the Bassian Subregion which was certainly stronger when moister conditions prevailed in southeastern Australia.

Thirteen of the 36 species (36%) reported have a significantly Eyrean distribution and all 13 appear to maintain continuous distributional contact with their like populations in more arid areas.

There are also 4 species (Aprasia striolata, Hemiergis peronii, Varanus gouldii rosenbergi and Morethia obscura) which occur in southwestern Australia (South-Western Subregion) which are absent from, or restricted to western parts of south eastern Australia. Two species (Delma molleri and Amphibolurus decresii) are essentially endemic to mid-southern Australia.

Conclusions:

1. The reptiles of the Mt. Lofty Ranges are a composite fauna made up of mainly Bassian (19 of 36=53%) and Eyrean (13 of 36=36%) species.
2. Four of the Bassian species (Egernia cunninghami, Sphenomorphus tympanum, Austrelaps, sp, and Suta flagellum) have been restricted in distribution and are relictual in the Ranges.
3. Varanus gouldii rosenbergi is a relict which also occurs in southwestern Australia.
4. At least four of the Bassian species (Chelodina longicollis, Sphenomorphus

quoyii, Notechis scutatus and Pseudechis porphyriacus) presently maintain contact with their like populations in southeastern Australia via the Murray Valley.

5. The Eastern Water Skink is probably a recent invader from the Murray Valley.

6. The Eyrean species which occur in the Ranges appear to be intrusive, some of then (eg Gehyra variegata, Heteronotia binoei) do not occur in the wetter parts of the Ranges.

7. There are four species with an essentially southwestern and midsouthern Australian distribution, and two which are endemic to midsouthern Australia.

Acknowledgements:

I thank Dr. T.F. Houston for advice and the checking of specimens in the SA Museum, Dr. H.G. Cogger and Mr. P. Rankin for kindly offering constructive criticisms of the manuscript; Mr. J. Fowler drew my attention to the Ctenotus uber near Clarendon and Mr. P. Rankin to the Australian Museum specimen of A. decresii from Koonanberry Mountain. The many members of the SA Herpetology Group who gladly participated in the field excursions on which much of the information was collected are gratefully acknowledged. I am very grateful to Mrs Jan Ehmann who patiently assisted in manuscript preparation and Mrs Alana Young for typing the manuscript.

References:

Cogger, H.G. (1975) Reptiles and Amphibians of Australia. Reed, Sydney.

Ehmann, H.F.W. (1973) Reptiles. Chapter 6 in York Peninsula a natural history. ed. D. Corbett, Univ. of Adelaide.

Houston, T.F. (1974) Revision of the Amphibolurus decresii complex (Lacertilia : Agamidae) of South Australia. Trans. R. Soc. S. Aust., 98 (2): 49-60.

Jessup, R.W. (1961) A Tertiary-Quaternary pedological chronology for the southeastern portion of the Australian arid zone. J. Soil Sci., 12: 199-213.

Keast, J.A. (1959) The reptiles of Australia in Biogeography and Ecology in Australia. (J.A. Keast, R.L. Crocker, & C.S. Christian eds) Monographiae biol, Vol. 8, W. Junk, The Hague.

Mertens, R. (1957) Ein neuer melanistischer Waran aus dem sudlichen Australien. Zoologischer Anzieger, 159 (1/2): 17-20.

Rawlinson, P.A. (1966) Reptiles of the Victorian Mallee. Proc. Roy. Soc. Vic., 79 (2): 605-619.

Rawlinson, P.A. (1971) Reptiles of Victoria. in Chapter 1 Victorian Year Book 8[illegible]: 11-36. ed. V.H. Arnold.

Rawlinson, P.A. (1974) Natural History of Curtis Island. 4. The reptiles of Curtis and Rodondo Islands. Pap. Proc. R. Soc. Tas., 107: 153-170.

Smith, M.J. (1976) Small fossil vertebrates from Victoria Cave, Naracoorte South Australia. IV. Reptiles. Trans. R. Soc. S. Aust., 100 (1): 39-51.

Sprigg, R.C. (1952) The geology of the South East Province, South Australia, with special reference to Quaternary coast line migrations and modern beach developments. Bull. Geol. Survey of South Aust., No. 29.

Storr, G.M. (1971) The genus Ctenotus (Lacertilia, Scincidae) in South Australia. Rec. S. Aust. Mus., 16 (6).

****

Diplodactylus vittatus		+			+	+					+	+		+	
Gehyra variegata		+			+							+	+		
Heteronotia binoei		+			+							+	+		
Phyllodactylus marmoratus			+	+	+	+		+			+			+	
Underwoodisaurus milii		+	+	+	+	+		+			+	+		+	
Varanus gouldii rosenbergi				+				+	+		+			+	
Cryptoblepharus boutonii	+										+	+	+	+	
Ctenotus robustus			+	+	+	+					+		+		
Ctenotus uber orientalis		+			+						+	+			
Egernia cunninghami									+		+				
Egernia striolata		+			+		+				+	+	+		
Egernia whitii			+	+		+		+			+				
Hemiergis decresiensis			+	+	+	+		+			+				
Hemiergis peronii			+	+	+	+		+			+	+		+	
Leiolopisma guichenoti			+	+				+			+				
Leiolopisma trilineata			+	+				+			+			+	
Lerista bougainvillii		+	+	+	+	+		+			+	+			
Menetia greyi	+							+				+			
Morethia obscura			+	+	+	+	+	+				+		+	
Sphenomorphus quoyii							+				+		+		
S. tympanum (warm temp. form)				+					+		+				
Tiliqua scincoides			+	+	+						+		+		
Tiliqua rugosa	+											+		+	
Typhlina australis	+											+		+	
Austrelaps sp.									+		+				
Notechis scutatus				+			+	+			+				
Pseudechis porphyriacus							+				+		+		
Pseudonaja textilis			+	+	+	+	+	+			+	+	+		
Suta flagellum									+		+				

Table 2: Occurrence of the species found in the Mt Lofty Ranges in mainly adjacent areas; also general distribution.

Reptiles found in Mt Lofty Ranges	Occurrence in mainly adjacent areas										General distribution					
	Widespread in SA	Adjacent semi-arid areas to N. and N.E.	Northern-most Upper South East of SA	South-East of SA and S.W. VIC	Southern Flinders Ranges	Yorke Peninsula and Adelaide Plain	Murray system in SA	Isolated on SA offshore islands	Relictual in Mt Lofty Ranges		Bassian Subregion	Eyrean Subregion	Torresian Subregion	South-Western Subregion	mid-southern endemic	
Chelodina longicollis				+			+				+		+			
Amphibolurus barbatus			+	+	+	+					+		+		+	
Amphibolurus decresii					+			+				+			+	
Aprasia striolata			+	+				+			+			+		
Delma molleri					+	+									+	
Lialis burtonis	+							+			+	+	+	+		
Pygopus lepidopodus			+	+	+	+					+	+	+	+		
Diplodactylus vittatus		+			+	+					+	+		+		

FRESHWATER TORTOISES AND LIZARDS OF THE BUNDABERG REGION.

By P. Richardson, The Dream Time Reptile Reserve, Bundaberg, Qld.

INTRODUCTION

The following list of tortoises and lizards occurring in the Bundaberg region is compiled from the personal observations of the author and H. Frauca.

Based on the number of sightings over a twelve month period each species has been included in one of the categories set out below.

Over 50 sightings in a twelve month period -Abundant.
Over 25 sightings in a twelve month period -Common.
Less than 15 sightings in a twelve month period -Uncommon.
Less than 5 sightings in a twelve month period -Rare.

CHELONIA

Freshwater Tortoises Family Chelidae

Broad-shelled River Tortoise *Chelodina expansa*	Rare
Long-necked Tortoise *Chelodina longicollis*	Common
Saw-shelled Tortoise *Elseya latisternum*	Uncommon
Krefft's River Tortoise *Emydura kreffti*	Abundant

SQUAMATA, SUBORDER SAURIA

Geckos Family Gekkonidae

Wood Gecko *Diplodactylus sp*	Rare
Spotted Dtella *Gehyra punctata*	Common
Tree Dtella *Gehyra variegata*	Abundant
Bxynoe's Gecko *Heteronotia binoei*	Abundant
Robust Velvet Gecko *Oedura robusta*	Rare
Southern Spotted Velvet Gecko *Oedura tryoni*	Abundant
Lesueur's Velvet Gecko *Oedura lesueurii*	Uncommon
Northern Leaf-tailed Gecko *Phyllurus cornutus*	Rare

Scaly-footed lizards Family Pygopodidae

Delma tincta	Uncommon
Burton's Snake-lizard *Lialis burtonis*	Common

Dragons Family Agamidae

Bearded Dragon *Amphibolurus barbatus*	Abundant
Frilled Lizard *Chlamydosaurus kingii*	Rare
Diporiphora australis	Common
Eastern Water Dragon *Physignathus lesueurii*	Abundant

Monitors Family Varandidae

Gould's or Sand Monitor *Varanus gouldii*	Common
Spotted Tree Monitor *Varanus timorensis*	Uncommon
Lace Monitor *Varanus varius*	Common

Skinks Family scincidae

Carlia sp	Abundant
Ctenotus robustus	Common
Copper-tailed Skink *Ctenotus taeniolatus*	Abundant

Tree Skink	Egernia striolata	Uncommon
Eastern Water Skink	Sphenomorphus quoyii	Abundant
	Sphenomorphus scutirostrum	Abundant
Pink-tongued Skink	Tiliqua gerrardii	Rare
Verreaux Skink	Anomalopus verreauxii	Uncommon

REFERENCES

Cogger, H. (1975) 'Reptiles and Amphibians of Australia' A.H. & A.W. Reed.

****

AUSTRALIA

The Affiliation constitution has been finalised and is now being circulated for final signing.

Member societies have started circulating copies of information they consider of possible interest or value to their sister societies. This is bound to be of considerable value in the long term.

Richard Wells, AHS Councillor has suggested a joint societies field survey and get together for the Affiliation societies at Christmas 1976 in north-western Victoria. The SAHG have tentatively planned a trip to the Mt. Gambier area at about the same time. Some compromise can no doubt be reached and Melbourne and Whyalla members will hopefully be able to make it too. Anyone interested? The number of people able to participate matters little, as long as there's a get together. It could be over a two or three week period with people "dropping-in" and participating when they can.

ADELAIDE

The SAHG's Oraparinna Survey (in the Flinders Ranges) turned up Amphibolurus nobbi and Egernia multiscutata in the Wilpena Pound area. Both are significant range extensions. Trips being planned include Innes Conservation Park on Yorke Peninsula on the October long weekend and a spotlighting trip on the 13th November. No doubt the usual quota of rabbits will be caught while searching for herps.

Another Wildlife Show is planned for March 1977; it will be a lot of work, but it's enjoyable and worthwhile. More details of activities at the general meetings held at the South Australian Museum on the 2nd Tuesday of the month at 8pm.

MELBOURNE

We have been very busy with implementing autonomy, drawing up a new constitution and involvement with the drafting of the protective legislation for Victoria. Protection is due to come into force on the 1st November 1976.

Our committee has been significantly increased in size to cope with increased activity. Members are being encouraged to choose their own study project and area as individuals or small local groups. When the projects have progressed sufficiently other members will be invited to visit, examine and comment on them. This should prove an interesting change to the usual field trips.

Meetings are held on the third Thursday of the month at 8pm in the Arthur Rylah Institute for Environmental Protection, Browns Road, Heidelburg.

SYDNEY

At the AGM held at the Australian Reptile Park, Eric Worrell patron and Life Member of AHS focused members' attention on the problems being experienced by herpetologists with the reptile protective legislation in NSW. As a result the AHS plans to prepare a submission to NP&WS during the next few months.

The new constitution has been settled in and the amendments are finished with at last. Now back to more herping. Future meetings will include visitors talking about Tuataras, and Australian skinks; the warmer weather will see an increase in field trips too.

Meetings are on the fourth Friday of each month at 8pm in the Australian Museum.

WHYALLA

Over Easter sixteen members went in search of Parademansia microlepidota up the Birdsville Track. Many interesting desert species were found and at least ten Western Browns (Pseudonaja nuchalis) were seen. Peter Mirtschin and Hans van Dyk stayed on for another week in search of the 'inland taipan" and Desert Death Adders, but found only Paradoxus sweetus nothingus.

Despite set backs the Fauna Park is progessing well; a booklet on Eyre Peninsula's snakes has been published mainly for sale from the Park. Copies can be purchased by writing to the WHG; cost (including postage) is $1.00.

The next trip being considered might be to the Everard Ranges.

****

NOTES ON BREEDING OF DEATH ADDERS IN CAPTIVITY.

By P.J. Mirtschin, 18 Creber St., Whyalla SA 5600.

Breeding of reptiles in captivity is important for a number of reasons:

1. It provides information about the breeding biology and requirements of reptiles.
2. Captive breeding reduces collecting pressure on wild populations.
3. Efficient techniques can be developed to perhaps aid in re-establishing endangered wild populations.
4. Provides growth rate study specimens.

Death Adders, Acanthophis antarcticus, are one of the more popular snakes among herpetologists although few have been able to breed them in captivity. The following is an account of the keeping and breeding of Death Adders at Whyalla, South Australia.

The specimens used in the exercise were collected from the Middleback Range area of south Australia, near Whyalla. This iron ore-bearing range extends for about 45 km in an approximate North South direction on Eyre Peninsula. The range has scattered rocky outcrops, mallee vegetation and lies approximately on Goyder's Line (approx. 250 mm rainfall isohyet). Colection position was 33°23' S, 137°10' E.

Whyalla 33°02' S, 137°10' E. is about 50 km North to NE of the Range and generally has a slightly warmer, drier climate.

All captive adults were fed only with mice.

A male and female were collected in January-February 1974 and kept in a heated enclosure during the winter of that year. Later in 1974 a further male and female were included. In November 1974 the original male was observed attempting to mate

with both females on different occasions. The attempts often lasted for more than ten hours. Actual coupling was not observed and the attempts ceased by the end of November. The male was observed carressing the female with his tail, rubbing it over the female's tail in rapid repeated strokes. After this it was hoped that both females would become pregnant, but March and April passed without any births.

In April 1975 it was decided to place the four snakes in an open topped box and expose them to daily temperature fluctuations as well as normal photoperiods. A rectangular box 120 cm X 80 cm X 60 cm was constructed and placed inside a shed with clear fibreglass sheeting in the roof. The bottom of the box was covered by a 3 cm layer of sand.

Inside the shed, protection from the wind and rain was afforded and winter temperatures were not as severe at night and were warmer during the day. During June and July, the coldest months, a 25 watt globe was suspended in the box and switched on at night. This provided a local area of warmth if required.

No further mating attempts were noted but in December 1975 the two females appeared to be gravid and their appetites were voracious. They were separated from the other snakes and put into separate unheated aquariums, still in the same shed.

By the beginning of February both females were refusing food. On 19th March 1976 the first batch was born during the night. When found they were still inside their embryo sacs and the ambient temperature was below 20°C. They were all removed from the aquarium and the sacs manually broken, upon which they began to move.

Of 24 born in the first clutch, 16 survived and it is assumed that those which died were born early and suffocation was the cause of death.

On the 20th March, the second female gave birth under almost identical conditions, however this time they were noticed very early in the morning while the female was still giving birth. Again the juveniles remained inside their sacs and were all manually broken out. Of the 19 born 17 survived, one died because it was deformed, having three jaws and two eyes located in the centre of the middle jaw. The higher survival rate in the second clutch was possibly due to their earlier removal from their embryo sacs.

After a two day recovery period, the females were returned to the male death adders and on each occasion one of the males immediately commenced courtship actions.

In retrospect, it would appear that heating the females cage during the final stages of pregnancy may have overcome the problem. It is puzzling that both females chose unfavourable temperature conditions to give birth. Perhaps it was captivity stress.

It is hard to draw any conclusions on whether heating affects breeding of snakes or not since to be sure of the actual course of events, an observer would have to watch the snakes 24 hours a day in spring and through summer. There is a possibility the snakes were inseminated in the wild and retained the sperm until suitable conditions for embryo development prevailed. Further study should throw more light on the subject.

Acknowledgements:

I would like to thank all those who helped in the care of the snakes and those who offered assistance and advice, in particular H. Nygren, P. Fennell, D. McConnville, P. Hudson, W. Clark, H. van Dyk, C. Kavanagh, and Dr. G. Spencer.

********** ****

A NOTE ON A POSSIBLE DIVERSIONARY DEFENCE MECHANISM IN THE WORM LIZARD, APRASIA INAURITA KLUGE.

By P.R. Rankin, 12 Finlays Ave., Earlwood, N.S.W. 2206

Recently, I had the opportunity to examine a live Aprasia inaurita in the Australian Museum from Annuello, Vic. The specimen was an adult, apparently in good health when observed. An examination of the literature reveals that no previous mention appears to have been made of the behavioural trait presented here.

In life, the species is a light fawn colour dorsally, displaying a vivid orange tail which terminates quite bluntly. A colour plate of a specimen which Kluge (1974) considers to be A. inaurita appears in Bustard (1970), Plate 42. The specimen examined here had a regenerated tail which displayed the vivid red colour.

While attempting to place the animal in a suitable position to photograph it, I noticed it moving its tail in occasional twitching spasms. In fact, when further provoked, it raised its tail in a nearly vertical arc above the ground, lying motionless in such a position. I experimented further, and found that prodding its head was more likely to elicit movement in the tail than the head. Under such circumstances, it lay with its head as low to the ground as possible, sometimes pushed beneath the body, with the tail elevated strongly, and occasionally moving slightly. The observations were carried out over a period of several days, and tail raising occurred often enough to be regarded as significant. It should be noted here that the behaviour described did not occur on every provocation, and in a few instances the lizard merely attempted to flee.

A very tempting explanation of the above observation is that the tail, being a bright colour, and ending rather bluntly, is used as a decoy for predators - its appearance and movements resembling a head. However, since Aprasia inaurita is a burrower (Cogger, 1975) and is probably rarely if ever found in the open, the evolution of such a highly specialized defence mechanism seems puzzling. The liklihood of A. inaurita ever being in a position where individuals could use such behaviour to their advantage seems remote, except for the case of a predator which is able to dig them up. In any case, it would appear that burrowing quickly into loose soil or down a burrow would be a far better defensive strategy to employ. The latter forms of defence are used quite successfully in two other genera of cryptozoic lizards, namely Anomalopus and Lerista (pers. obs.), and may in fact by used by A. inaurita as I have no field experience with the species. The observations described here were carried out on hard surfaces when the lizard was cold, so may only be applicable to these circumstances.

On the other hand, Bustard (1970) appears convinced that the brightly coloured tail of the species being considered here is purely a defence mechanism, although he makes no mention of any associated behaviour. He says (p. 90) "The red tail is yet another type of protective device. A predator is likely to be attracted to this brightly coloured portion. If it grabs it the tail is autotomised and the worm lizard has a change to escape while the predator's attention is occupied by the wriggling tail".

It is interesting to note here that Schmidt and Inger (1957) report that the cryptozoic Pipe snakes (Cylindrophis) of South East Asia have bright red ventral surfaces of their tails which they raise and display when disturbed. The authors claim that the habit is not uncommon among snakes, and cite the examples of the Ring Necked Snakes (Diadophis) of U.S.A., and Coral Snakes (Micrurus and Leptomicrurus) of South and Central America. Of further interest is the fact that several of the species which indulge in "tail raising" have abbreviated tails. This could either be due to some adaptation to a burrowing existance or the tail raising trait.

The possibility exists that the behaviour pattern, coupled with the brightly coloured tail is an act of mimicry. However, since my personal experience of the wildlife of the mallee is limited, I am unable to speculate on this point.

It would appear that some form of selection has been involved in the evolution of the behavioural trait described. In view of this, no explanation for the trait other than diversion seems feasable.

ACKNOWLEDGEMENTS

I would like to thank Dr. H. Cogger and Mr H. Ehmann for offering constructive criticisms of the manuscript, andMrs A. Young for typing it.

REFERENCES

Bustard, H.R. (1970) 'Australian Lizards'. Collins.

Cogger, H.G. (1975) 'Reptiles and Amphibians of Australia'. Reed.

Kluge, A.G. (1974) 'A taxonomic revision of the lizard family Pygopodidae'. Misc. Publ. Mus. Zool. Univ. Michigan, 174: 1-221.

Schmidt, K.P. and Inger, R.F. (1957) 'Living Reptiles of the World'. Hamish Hamilton, London.

****

THE BIOLOGY OF SEA SNAKES
Edited by William A. Dunson

Published by University Park Press, Baltimore, London, Tokyo.
Australian Recommended Price, $39.65.

For various reasons, poorly understood biological subjects sometimes attract several workers concurrently - thus there was a spate some years ago of investigations of thermoregulative behaviour, and more recently a blossoming of interest in marine herpetology, particularly sea snakes.

Sea Snakes had been largely ignored by herpetologists both professional and amateur. Partly because of this they are a fertile field for investigation in which the non-professional may well be able to break new ground if he has the facilities for maintaining salt water aquaria and has access to specimens.

There have been many recent expeditions by numerous workers to collect sea snakes and their venoms for various purposes and Australia, having some 60% of known species in its waters, has attracted the interest of international researchers. The material which is included in "The Biology of Sea Snakes" was developed largely from two expeditions undertaken by the research vessel Alpha Helix in Australasian waters, indeed the title could almost have been "Biology of Australasian Sea Snakes."

The book is organised into six sections each of from one to six chapters. Preceding these sections is an introduction that includes contributions which do not readily fit any of the section headings.

While some of the subjects treated, biochemistry of venom and histology of sensory organs for instance, may be of a more specialised nature than would appeal to all subscribers to Herpetofauna, the sections dealing with natural history of Australasian species, ecological relationships and much of the physiological material and likely to be of general interst. The chapter written by Dr. Harold Cogger on the

taxonomy and distribution of Australian and New Guinea species may well be recognised by the reader as much of it is identical to the excellent text of his book "Reptiles and Amphibians of Australia" but includes more detailed maps with introductory discussion and references of greater depth.

One of the more unusual habits mentioned in this book concerns the feeding of Aipysurus endouxii and Emydocephalus annulatus which dine exclusively on fish eggs. However another species, Pelamis platurus, is perhaps of greater interest to readers of Herpetofauna, because of its more frequent occurrence in temperate waters. An entire section is devoted to its eastern Pacific population and it also features in several other chapters. Knowledge of the biology of this species in waters off N.S.W. leaves many gaps but it would not appear to have the thermal requirements that are attributed to the eastern Pacific population, (previously reported by the book's editor to require a temperature in excess of 20°C for feeding and breeding). In this book Dr. Cogger has presented statistics to indicate that no such limitations could act on a permanent population off N.S.W. The Yellow Bellied Sea Snake also emerges as the most successful of marine reptiles in as much as it is the only totally pelagic species, quite independent of both land and ocean floor. The body form and scalation also point to it's high degree of specialization.

This book is highly recommended not only to those who have contact with sea snakes but for all who wish to develop their herpetological understanding. It reviews current knowledge and schools of thought and is in fact the only significant volume on the Hydrophiidae to be published for fifty years. Let us hope that sufficient individuals and libraries will overcome the problem of its price to allow access of all who are interested.

- David B. Millar.

****

by Australian Herpetological Society Members, P.O. Box R79 Royal Exchange, Sydney 2001.

During the January 1976 meeting of the Australian Herpetological Society, members participated in a discussion about their observations on Water Dragons. This was tape recorded and later transcribed and arranged under subheadings. Thw written notes were then stencilled and copies circulated tomembers. Hopefully other Societies will contribute similar discussion results. The name of each member who contributed is underlined.

1 Behaviour of Water Dragons

a. Breeding

One pair of adults has been maintained in captivity for five years, (1971-1975), breeding once a year during three of these years and twice during two years. The number of eggs in a clutch varied from 6 to 12. In 1975, two clutches were laid, the first being 12 in number, the second 8. (P.Harlow).

The eggs were taken from the laying site and placed in an open container filled with sand. The container was then placed in the middle of an open lawn, in an excavated hole, so that the edges of the container were level with the lawn (the surrounding earth aiding in temperature control). The eggs received 6 to 7 hours sun on a clear day and were protected from excess water or heat when necessary. The resulting hatching rate was approximately 95% (note: sand had been heat sterilised). (P. Harlow)

During 1974, 18 eggs were laid by a female three days after capture, nine of which were infertile (two hours after they were laid these nine turned yellow and went soft). (M. Maddocks)

b. Feeding

Water Dragons are mainly insectivorous in the wild, eating large amounts of the same type of insect, such as cicadas (P. Harlow). In captivity they are omnivorous, eating mice, water skinks (Sphenomorphus quoyii), fruit, insects etc and even water snails. (G. Swan)

M. Maddocks reports them eating crayfish (yabbies), water striders and water beetles. G. Husband has observed captive juveniles eating the introduced fish Gambusia. P. Rankin observed 5 or 6 specimens sitting beside the Chichester Dam in Dungog State Forest. They dived into the water at intervals, then came up onto a log, appearing to be eating something (their jaws moving as they emerged).

c. Territoriality

In August 1974, two male specimens were seen fighting on a rock above a waterfall. The fighting lasted for ten minutes, including biting and scratching about the neck etc., until one left, heading into the bush, while the other remained. (M. Maddocks) Males will push off intruding males on logs. Females carry out 'head-bobbing' behaviour as well as males, and specimens tend to keep to one homesite. (R. Wells)

d. General Habits

One specimen spent 55 minutes underwater at Casula in the George's River. Others have spent over an hour on several instances in captivity. When approached in the wild, they dive in and either swim along the surface, head above, to nearby land (eg. a log) or go straight underwater, swimming to deeper parts. They may also swim out then come back under the bank (in the case of large adults) going into burrows presumably made by water rats (in the larger rivers). When swimming they generally go upstream and may hang onto the bottom when they are still. (R. Wells)

Juveniles are active at any time of the day. Two kept in a 1m tank for 8 months often jumped up in the air to catch mosquitoes. (M. Maddocks) Juveniles are generally found closer to the ground in the wild state, while adults are often above ground in trees etc. (R. Wells) At Fish Ponds Creek, Beecroft and another creek near Pennant Hills NSW, young Water Dragons make holes in driftwood which collects in small piles, sometimes 1-2 metres high. Four juveniles were observed living in one such pile at Pennant Hills over a period of 3 days, moving between the driftwood and water, and going into burrows under tree-roots nearby. (M. Maddocks)

Specimens will sit out in the rain - M. Maddocks observed one do so for 3 days when the temperature was not below 21^{0} all day. P. Harlow has one male specimen which often semi-hibernates lying exposed on a log for 2-3 months, occasionally opening its eyes and looking around, but mostly appearing to sleep. This specimen has been in captivity for 8 years. In the Royal National Park, specimens have been observed hibernating in sandstone crevices and hollow logs. R. Wells has noted that they hibernate around Sydney in burrows up to 2m deep with branching tunnels. Burrows in cliffs are mainly constructed in clay soils. When they are occupied, a number of claw marks can be found at the entrance.

Water Dragons have been seen on logs at night, usually above water. Specimens were found in this position in the Serpentine River near Ebor, NSW during summer months at 9-10pm. (M. Anstis)

This species has also been found in association with saline water, M. Maddocks noted some juveniles feeding beside a saline pond 2-3 metres deep, which had been blocked off by a sand bar from the main water flow of an estury of Lane Cove Creek near Turramurra, NSW. P. Rankin has observed them at Myall Lakes and Lake Macquarie, NSW, noting that these specimens were darker than normally found in other areas. He has not seen any large specimens near saline water. Mrs Baker has

seen specimens near Ballina, NSW close to a saline lake.

2 Miscellaneous Observations

Water Dragons can be caught using snorkel and goggles and can be picked up easily in shallow water. During winter they can be dug out of burrows. When on land they need to be approached with extreme caution. (R. Wells) G. Sinclair states that specimens chased up a tree normally leap into water below, but found that one heavily gravid female did not move from a tree branch and was easily caught.

G. Stephenson has found Water Dragons in a drain surrounded by rubbish near a waterfall in Boronia Park, NSW. There are many to be found on the top of Oxford Falls, NSW.

P. Rankin has noted that specimens held by the end of the tail will drop the last third of the tail quite easily, and regeneration will occur. Two tails may regenerate if the original is only partly broken off. Damaged regenerated tails will regenerate again.

Predators: Black Snakes (Pseudechis porphyriacus) in the Snowy River, NSW were seen feeding on juvenile Water Dragons. (P. Ludovici) A Brown Snake (Pseudonaja textilis) in captivity ate a juvenile specimen. (M.Anstis) Copperheads (Austrelaps superbus) have been seen eating Gippsland Water Dragons (Physignathurs lesueurii howittii), (M. Maddocks) and one large male Sphenomorphus quoyii attached and tore at the legs of juvenile Water Dragons in captivity. (M. Maddocks)

Pollution effects: During 1962-70 at Fairfield, NSW, excessive oil and factory wastes were deposited in Prospect Creek. Water Dragons living downstream from factories developed ulcers on the dorsum and swollen eyes, eye infections and blindness. Months after the clearing of this creek, ulcers were still present on these specimens. (R. Wells)

Observations on distribution: P. Ludovici has observed P. lesueurii in the Currumbin rainforest, Qld. P. Rankin states that there may be intergration between Eastern and Gippsland Water Dragons in the Shoalhaven River system (eg. Kangaroo Valley), where specimens seem to be intermediate between these two subspecies, although no behavioural differences were observed).

****

COVER PHOTOGRAPH - Stellate Knob-tailed Gecko (Nephurus stellatus)

from Tumby Bay area, Eyre Peninsula South Australia.
Occurs in sandy soils, excavating its own burrow in banks and mounds from which it emerges on warm nights to hunt spiders, scorpions and smaller geckoes. Its distribution correlates well with the Great Victoria Desert and its associated wind extended sand dune systems onto Eyre Peninsula.

This particular specimen has six fingers; such an abnormality is probably of some value when digging. The smallest scale division represents one millimetre. (Photo and caption) Harry Ehmann.

NOTES TO CONTRIBUTORS

"Herpetofauna" publishes original articles on any aspect of reptiles and amphibians. Articles are invited from any interested authors; encouragement is given to articles reporting field work and observations. Contributors should use a recent issue of "Herpetofauna" and the points listed below as a guide in preparing articles.

1. Publication Policy

Authors are responsible for the accuracy of the data presented in any submitted article. Current and formally recognised taxonomic combinations should be used unless the article is itself of a taxonomic nature proposing new combinations or describing new species.
Upon publication, copyright in the article (including illustrations) become the property of the Affiliation. The original illustrations will be returned to the author, if requested, after publication.

2. Submission of Manuscript

One copy of the article (including any illustrations) should be submitted, the author retaining a second copy. All material should be typewritten or clearly hand-printed and double-spaced. Quality bond paper should be used and a good margin provided on each side of the script. Grammar and punctuation should be checked and all pages must be numbered consecutively.
The metric system should be used throughout. All scientific names and sub-headings should be underlined. The author's name and address should appear under the title. Latitude and longitude of localities mentioned should be indicated.

3. Illustrations

Illustrations (drawings, maps or photographs) should be one and a half times the anticipated published size if possible. The actual dimensions of a printed page in the journal (excluding margins) will be 12.7 cm (width) x 18.0 cm (depth).
Drawings should be in Indian ink on high quality, matt white paper. Authors should retain a copy of each illustration. Authors submitting photographs are requested to consider helping to meet the cost of their photographic plates in accordance with their ability to pay.
Coloured illustrations cannot be accepted unless the author is prepared to pay the extra cost.

4. References

Any references made to other published material must be cited in the text, giving the author, the year of publication and the page numbers, if necessary. eg. Jones (1968, p. 24). At the end of the article, full reference should be given (see previous journals).

5. Proofs

If any changes, other than minor ones, need to be made to the article, a proof with suggested changes will be sent to the author for his revision. Proofs should then be re-submitted by the author as soon as possible.

****

VOL. 8 NO. 2 AUGUST, 1976

CONTENTS

ARTICLES:

Additional Notes on the Conondale Range Herpetofauna
by G.V. Czechura 2

The Reptiles of the Mt. Lofty Ranges, South Australia, Part 2.
by H.F.W. Ehmann 5

Freshwater Tortoises and Lizards of the Bundaberg Region
by P. Richardson 14

Notes on Breeding of Death Adders in Captivity
by P.J. Mirtschin 16

A Note on a Possible Diversionary Defence Mechanism in the Worm Lizard, Aprasia inaurita Kluge
by P.R. Rankin 18

Observations on the Eastern Water Dragon Physignathus lesueurii in the natural state andin captivity
by A.H.S. Members 20

Addenda to Snakes of the Bundaberg Region
by P. Richardson 4

FEATURES

Editorial 1

Hisses and Croaks 15

Book Review 19

Description of Cover Photograph 22

Notes to Contributors 23